

*If you are using a printed copy of this procedure, and not the on-screen version, then you **MUST** make sure the dates at the bottom of the printed copy and the on-screen version match. The on-screen version of the Collider-Accelerator Department Procedure is the Official Version. Hard copies of all signed, official, C-A Operating Procedures are available by contacting the ESSHQ Procedures Coordinator, Bldg. 911A*

C-A OPERATIONS PROCEDURES MANUAL

(Collider Electrical Power Supply Group Procedure CPS-001)

Note: This document was formerly a C-A Group Procedure. The content of the group procedure was reviewed by the Technical Supervisor. All approvals and/or issue dates of the original group procedure are maintained for present use.

15.2.1 Power Supply System Lock-Out Procedure

Text Pages 3 through 8

Hand Processed Changes

<u>HPC No.</u>	<u>Date</u>	<u>Page Nos.</u>	<u>Initials</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Approved: _____ *Signature on File* _____
Collider-Accelerator Department Chairman Date

D. Bruno



Procedure: C-A-CPS-001
Revision: 05
Revision Date: 1/11/07

COLLIDER-ACCELERATOR DEPARTMENT

Title: Power Supply System Lock-Out Procedure
(Do not use this procedure for magnet warm up because the warm up heaters are locked out here)
(Use procedure C-A-CPS-004 for P.S. lockout during magnet warm up)

Author: D. Bruno

Group: Collider Power Supply

Group Leader concurrence indicates procedure is still current.

Group Leader: Don Bruno Date: 01/11/07

**This Procedure Must Be Reviewed By the Technical Supervisor Prior to use.
If This Procedure Does Not Reflect Current Equipment/Processes
Then Immediately Notify the Group Leader**

Power Supply System Lock-Out Procedure

This document will describe the lock-out procedure for all RHIC ring power supplies and warm up heaters. Please note lock/key number in blank. Sign and date this form at the bottom when complete.

I. Main Power Supplies in 1004-B:

1. Turn off the Control Power Switch:

Front Panel following PS.

(PPE = class 0+)

PBDFT _____
PBDR _____
PBQFT _____
PBQR _____
PYDFT _____
PYQFT _____
PYQR _____
PYDR _____

Before locking out the 480V disconnects observe 480V on all three line to line voltages on the volt meters on the front of the power supplies. Next, make sure all of the lights are flashing on the voltage monitor gauges on the back of the p.s.

2. Lock out the following 480V disconnect Switches:

(PPE = class 4)

(These have kirklocks, take key with you)

SBDFT _____
SBDR _____
SBQFT _____
SBQR _____
SYDFT _____
SYQFT _____
SYQR _____
SYDR _____

After you lock out the 480V disconnect switch make sure all three line to line voltages on the volt meters on the front of the power supplies read zero. Next make sure all of the lights are flashing are OFF on the voltage monitor gauges on the back of the p.s.

3. If necessary, contact Carl Schultheiss or Fred Orsatti for proper shutdown of the Output Circuit Compartments. The engineer watching over this lockout will determine if the OCC requires lockout. If the OCC does not need to be locked out step 3 can be skipped.

OCC _____

If Carl Schultheiss or Fred Orsatti cannot be reached

Then turn off and lock out the following circuit breakers,

(Panel P4BRP4 breakers PPE = class 0+)

In panel P4BRP4 lockout breakers: 13 Dipole Yellow OCC _____

23 Quad Yellow OCC _____

8 Dipole Blue OCC _____

22 Quad Blue OCC _____

Inside the main p.s. labeled PBDFT on the right hand side, lock out the following white 110Vac breakers (PPE = 0+):

CB09 Blue Dipole Ramp Quad Ramp	_____
CB10 Yellow Dipole Ramp Quad Ramp	_____
CB11 Blue Dipole Flattop Quad Flattop	_____
CB12 Yellow Dipole FT Quad FT	_____
CB13 Yellow Quad OCC	_____
CB14 Blue Quad OCC	_____
CB15 Yellow Dipole OCC	_____
Blue Dipole OCC	_____

Wait 2 minutes. In panel P4BRP4 lockout breakers (PPE = 2):

7, 9, 11 Dipole Yellow OCC Blower & Cooling Elements	_____
2, 4, 6 Dipole Blue OCC Blower & Cooling Elements	_____
16, 18, 20 Quad Blue OCC Blower & Cooling Elements	_____
17, 19, 21 Quad Yellow OCC Blower & Cooling Elements	_____

II. Insertion Region Power Supplies:

1. Bldg. 1004-B (PPE = 4):
 - a.) Lockout PSB1, Brkr. 2R _____
 - b.) Lockout PSB2, Brkr. 4 _____
2. Bldg. 1006-B (PPE = 4):

Using Cable Lock-out....

 1. Lock out PSB1, Bkr's 4 and 7, _____
3. Bldg. 1008-B (PPE = 4):

Using Cable Lock-out....

Lock out SWBD MDPB Bkr's 3L and 4, _____
4. Bldg. 1002-B (PPE = 4):

Using Cable Lock-out....

Lock out SWBD MDP, Bkr's 3L and 4, _____
5. Bldg. 1012-A (PPE = 4):

Lock out Main Disconnect S12 AIR 480 _____
6. Bldg. 1010-A :

Note: Power Down Dump Switch APC

Using Cable Lock-out....

 - a.) Lock out R10ADS2/R10ADS3, Blu Dump switch (PPE = 0+): _____
 - b.) Lock out R10ADS4/R10ADS5, Yel Dump switch (PPE = 0+): _____
 - c.) Lockout Main Disconnect S10AIR480 (PPE = 4) _____

III. 50 Amp Correctors, Sextupoles, Snakes, Rotators and Magnet Warmup Heater System:

The following listed Alcove Breakers will shut down these systems (note: These main breakers, listed below, may turn off power to some of the warm up heaters. To be sure the warm up heaters are really turned off See Step IV.)

1. Alcove 1011-A.

Lock out Main Breaker Panel PN11A2 (208 VAC).

2. Alcove 1011-B.

Lock out Main Breaker Panel PN11B2 (208 VAC).

Lock out Main Breaker Panel PN11B4 (480 VAC).

Lock out PN11B3 circuits 21, 23, 25, 27 (110 VAC).

3. Alcove 1011-C.

Lock out Main Breaker Panel PN11C2 (208 VAC).

4. Alcove 1001-A.

Lock out Main Breaker Panel PN1A2 (208 VAC).

5. Alcove 1001-B.

Lock out Main Breaker Panel PN1B2 (208 VAC).

Lock out Main Breaker Panel PN1B4 (480 VAC).

Lock out PN1B3 circuits 21, 23, 25, 27 (110 VAC).

6. Alcove 1001-C.

Lock out Main Breaker Panel PN1C2 (208 VAC).

7. Alcove 1003-A.

Lock out Main Breaker Panel PN3A2 (208 VAC).

8. Alcove 1003-B.

Lock out Main Breaker Panel PN3B2 (208 VAC).

Lock out Main Breaker Panel PN3B4 (480 VAC).

Lock out PN3B3 circuits 21, 23, 25, 27 (110 VAC).

9. Alcove 1003-C.

Lock out Main Breaker Panel PN3C2 (208 VAC).

10. Alcove 1005-A.

Lock out Main Breaker Panel PN5A2 (208 VAC).

11. Alcove 1005-B.

Lock out Main Breaker Panel SPN5B2 (208 VAC).

Lock out Main Breaker Panel SPN5B4 (480 VAC).

Lock out PN5B3 circuits 21, 23, 25, 27 (110 VAC).

12. Alcove 1005-C.

Lock out Main Breaker Panel PN5C2 (208 VAC).

13. Alcove 1007-A.

Lock out Main Breaker Panel PN7A2 (208 VAC).

14. Alcove 1007-B.

Lock out Main Breaker Panel PN7B2 (208 VAC).

Lock out Main Breaker Panel PN7B4 (480 VAC).

Lock out PN7B3 circuits 21, 23, 25, 27 (110 VAC).

15. Alcove 1007-C.

Lock out Main Breaker Panel PN7C2 (208 VAC).

16. Alcove 1009-A.

Lock out Main Breaker Panel PN9A2 (208 VAC).

17. Alcove 1009-B.

Lock out Main Breaker Panel PN9B2 (208 VAC).

Lock out Main Breaker Panel PN9B4 (480 VAC).

Lock out PN9B3 circuits 21, 23, 25, 27 (110 VAC).

18. Alcove 1009-C.

Lock out Main Breaker Panel PN9C2 (208 VAC).

IV. Warm Up Heater Power Supplies:

1. Sector 12

Lock out Disconnect on Panel PNWH12Q5

2. Sector 1

Lock out Disconnect on Panel PNWH1Q5

Lock out Disconnect on Panel PNWH1A

Lock out Disconnect on Panel PNWH1B

Lock out Disconnect on Panel PNWH1C

3. Sector 2

Lock out Disconnect on Panel PNWH2Q5

4. Sector 3

Lock out Disconnect on Panel PNWH3Q5

Lock out Disconnect on Panel PNWH3A

Lock out Disconnect on Panel PNWH3B

Lock out Disconnect on Panel PNWH3C

5. Sector 4

Lock out Disconnect on Panel PNWH4Q5

6. Sector 5

Lock out Disconnect on Panel PNWH5Q5

Lock out Disconnect on Panel PNWH5A

Lock out Disconnect on Panel PNWH5B

Lock out Disconnect on Panel PNWH5C

7. Sector 6

Lock out Disconnect on Panel PNWH6Q5

8. Sector 7

Lock out Disconnect on Panel PNWH7Q5

Lock out Disconnect on Panel PNWH7A

Lock out Disconnect on Panel PNWH7B

Lock out Disconnect on Panel PNWH7C

9. Sector 8

Lock out Disconnect on Panel PNWH8Q5

10. Sector 9

Lock out Disconnect on Panel PNWH9Q5

Lock out Disconnect on Panel PNWH9A

Lock out Disconnect on Panel PNWH9B

Lock out Disconnect on Panel PNWH9C

11. Sector 10

Lock out Disconnect on Panel PNWH10Q5

12. Sector 11

Lock out Disconnect on Panel PNWH11Q5

Lock out Disconnect on Panel PNWH11A

Lock out Disconnect on Panel PNWH11B

Lock out Disconnect on Panel PNWH11C

All Keys Are To Be Placed In Lock Box Kept At Building 1004-B

Lock out performed by: _____

Date: _____

LIFE NUMBER: _____

Lock out performed by: _____

Date: _____

LIFE NUMBER: _____